CLAIMS

1. A method of forming an assembly structure for assembling and aligning an optoelectronic device and an optical waveguide, said optical waveguide comprising a light input end for rec iving light emitted from an output port of the optoel ctronic device, said method comprising the steps of:

- providing a bottom cladding layer on top of a substrate, said bottom cladding layer comprising a first and a second part, wherein each part comprises a top and a bottom surface separated by a distance d,

- providing an etch stop layer on at least part of the second part of the bottom cladding layer,

- providing a core layer on top of the bottom cladding layer, said core layer extending on both the first and the second part of the bottom cladding layer thereby covering at least part of the etch stop layer, and

forming an optical waveguide and one or more first alignment features on the assembly structure by:

a) defining, by a single mask process, parts of the core layer for forming an optical waveguide core and for defining a horizontal configuration of the first alignment feature(s),

b) removing parts of the core layer not defined in step a), thereby forming the optical waveguide core in the core layer and defining the horizontal configuration of the first alignment feature(s) in the core layer, said optical waveguide thereby extending along a first optical axis in a plane and at a distance larger than or equal to d from the bottom surface of the first part of the bottom cladding layer

c) removing parts of the etch stop layer not covered by the core layer,

d) providing a top cladding layer so as to at least partly cover the optical waveguide core and optionally the parts of the core layer providing the horizontal configuration of the first alignment feature(s), and

e) etching into the structure over the second part of the bottom cladding layer to remove the top cladding layer, the core layer and parts of the second part of the bottom cladding layer not covered by the etch stop layer, thereby forming the first alignment feature(s) in the second part of the bottom cladding layer so that at least one top surface of the first alignment feature(s) is in essentially the same plane as the top surface of the first part of the bottom cladding layer, said formation of the first alignment feature(s) comprising the step of forming a first and a second tapered side surface part in directions at least substantially parallel to the first optical axis.

2. A method according to claim 1, wherein the optical waveguide extends on the top surface of the bottom cladding layer at a distance substantially equal to d above the bottom surface of the bottom cladding layer.

3. A method according to any of the preceding claims, further comprising the step of removing the etch stop layer defining th one or more alignment features formed in the bottom cladding layer.

4. A method according to any of the preceding claims, further comprising the step of arranging th optoelectronic device on top of the one or more alignment features so as to obtain vertical alignment of the output port of the optoelectronic device with the light input end of the optical waveguide.

5. A method according to any of the preceding claims, wherein one or more second alignment features are arranged on the bottom of the optoelectronic device, and wherein the step of aligning the output port of the optoelectronic device with the light input end of optical waveguide further comprises the step of abutting said second alignment feature(s) to the first and second tapered side surface parts of the first alignment feature(s) so as to obtain horizontal alignment.

6. A method according to any of the preceding claims, wherein step e) comprises etching by reactive ion etching.

7. A method according to any of the preceding claims, wherein the photonic device comprises a waveguide having a second optical axis and wherein the photonic devices are positioned so as to make the first optical axis and the second optical axis at least substantially parallel.

8. A method according to any of the preceding claims, further comprising soldering the optoelectronic device to one or more electrical contact pads formed beside the alignment features on exposed parts of the substrate.

9. A method according to any of the preceding claims, further comprising the steps of:

- forming, on the substrate, a ridge at least partly encircling the optoelectronic device,

- providing a lid, and

- soldering said lid to said ridge for sealing the optoelectronic device and the input end of the waveguide.